

WHAT IS CLAIMED IS:

1. A display system for a device with reduced out-the-window visibility, comprising:
  - a display device;
  - a display processor operable to:
    - receive an image from a sensor, wherein the sensor is capable of providing an image of an area outside the device that is at least partially obscured from view of an operator by a portion of the device's structure;
    - combine the sensor image with symbols representing information regarding the operational state of the device, and
    - output the combined sensor image and symbols on the display device, wherein the display device is positionable to provide at least a portion of the out-the-window field of view to the operator, and the entire desired field of view for the operator is provided by the display device in combination with the out-the-window scene available through windows of the device.
2. The display system of Claim 1, wherein the display processor is configured to display the combined sensor image and symbols during one phase of operation, and another display image during another phase of the operation.
3. The display system of Claim 1, wherein the display processor is operable to determine the role of the operator and to display a preconfigured display image based on the operator's role.
4. The display system of Claim 3, wherein one of the preconfigured display images includes the combined sensor image and the symbols represent pre-selected operational information that is displayed during a predefined operational state.

5. The display system of Claim 3, wherein another preconfigured display image comprises a plurality of mutually exclusive windows of information, wherein the windows include information related to the device and various subsystems of the device.

6. The display system of Claim 5, wherein the display processor is further configured to generate a common display area associated with at least two of the windows, wherein the common display area can be customized by the operator to display detailed information related to the information displayed in the associated windows.

7. The display system of Claim 1, wherein the display device includes a flat panel screen.

8. The display system according to Claim 5 further comprising: a user input device configured to transmit operator input data to the display processor to enable the operator to select options for the display image.

9. The display system according to Claim 6 wherein: the common display area includes a scroll option to allow the operator to scroll through the information in the common display area.

10. The display system according to Claim 5 wherein: one of the plurality of windows includes advisory information regarding the status of the subsystems.

11. The display system according to Claim 10 further comprising: a selectable option to acknowledge the advisory information, wherein the advisory information is cleared from the display when the acknowledge option is selected.

12. The display system according to Claim 5 further comprising: a selectable option to display a checklist for at least one of the subsystems in one of the windows.

13. The display system according to Claim 5 wherein:  
one of the selectable options allows the operator to initiate diagnostic procedures for at least one of the subsystems.
14. The display system according to Claim 5 wherein:  
one of the selectable options allows the operator to display operational history for at least one of the subsystems.
15. A display system for an aircraft, comprising:  
a display device;  
a display processor operable to:
  - receive an image from a sensor, wherein the sensor is capable of providing an image of an area outside the aircraft that is at least partially obscured from view of a crewmember by a portion of the aircraft's structure; and
  - output the sensor image on the display device, wherein the display device is positionable to provide at least a portion of a desired out-the-window field of view to the crewmember, and the entire desired field of view for the crewmember is provided by the display device in combination with the out-the-window scene available through cockpit windows of the aircraft.
16. The display system of Claim 15, wherein the display processor is configured to combine the sensor image with symbols representing information regarding the operational state of the aircraft, and display the combined sensor image and symbols during one phase of flight, and another display image during another phase of the flight.
17. The display system of Claim 15, wherein the display processor is operable to determine the role of the crewmember and to display a preconfigured display image based on the crewmember's role.

18. The display system of Claim 17, wherein one of the preconfigured display images includes the combined sensor image and the symbols represent primary flight information that is displayed below a predefined altitude.

19. The display system of Claim 17, wherein another preconfigured display image comprises a plurality of mutually exclusive windows of information, wherein the windows include information related to the aircraft and various aircraft subsystems.

20. The display system of Claim 19, wherein the display processor is further configured to generate a common display area associated with at least two of the windows, wherein the common display area can be customized by the crewmember to display detailed information related to the information displayed in the associated windows.

21. The display system of Claim 15, wherein the field of view of the display device is approximately -20 degrees to +20 degrees horizontally.

22. The display system of Claim 21, wherein the field of view of the display device is approximately -10 degrees to -30 degrees vertically.

23. The display system of Claim 15, wherein the display device includes a flat panel screen.

24. The display system according to Claim 19 further comprising:  
a user input device configured to transmit crewmember input data to the display processor  
to enable a user to select options for the display image.

25. The display system according to Claim 20 wherein:  
the common display area includes a scroll option to allow the crewmember to scroll  
through the information in the common display area.

26. The display system according to Claim 19 wherein:  
one of the plurality of windows includes advisory information regarding the status of the subsystems.

27. The display system according to Claim 26 further comprising:  
a selectable option to acknowledge the advisory information, wherein the advisory information is cleared from the display when the acknowledge option is selected.
28. The display system according to Claim 19 further comprising:  
a selectable option to display a checklist for at least one of the subsystems in one of the windows.
29. The display system according to Claim 19 wherein:  
one of the selectable options allows the crewmember to initiate diagnostic procedures for at least one of the subsystems.
30. The display system according to Claim 19 wherein:  
one of the selectable options allows the user to display operational history for at least one of the subsystems.
31. An aircraft, comprising:  
a crewstation with cockpit windows;  
a first flat panel display device for one crewmember;  
a second flat panel display device for another crewmember; and  
a display processor operable to:  
receive a first sensor image, wherein the first sensor image includes an image of the area outside the aircraft that is at least partially obscured from view of the crewmembers by the nose of the aircraft;  
translate the first sensor image to the viewpoint of each crewmember; and output the translated sensor images on the respective display devices, wherein each display device is positioned to provide at least a portion of a desired out-the-window field of view from the viewpoint of the respective crewmember.

32. The aircraft of Claim 31, wherein the display processor is operable to combine the sensor image with symbols representing information regarding the operational state of the aircraft.

33. The aircraft of Claim 31, wherein the display processor is further configured to:

receive a second sensor image of a portion of the out-the-window scene; and  
fuse the first and second sensor images into a combined sensor image.

34. The aircraft of Claim 33, wherein the display processor is further configured to:

translate the combined sensor image to the viewpoint of each crewmember; and  
output each translated combined sensor image to the respective display device.

35. The aircraft of Claim 33, wherein the second sensor image provides an enhanced out-the-window field of view compared to the first sensor image in low visibility conditions.

36. The aircraft of Claim 35, wherein the display processor is configured to display the combined sensor image and symbols during one phase of flight, and another display image during another phase of flight.

37. The aircraft of Claim 35, wherein the display processor is operable to display a preconfigured display image based on the crewmember's role in operating the aircraft.

38. The aircraft of Claim 37, wherein one of the preconfigured display images includes the combined sensor image and the symbols represent primary flight information that is displayed below a predefined altitude.

39. The aircraft of Claim 37, wherein another preconfigured display image comprises a plurality of mutually exclusive windows of information, wherein the windows include information related to the aircraft and various aircraft subsystems.

40. The aircraft of Claim 39, wherein the display processor is further configured to generate a common display area associated with at least two of the windows, wherein the common display area can be customized by the crewmember to display detailed information related to the information displayed in the associated windows.

41. The aircraft of Claim 33, wherein the field of view of the display device is approximately -20 degrees to +20 degrees horizontally.

42. The aircraft of Claim 41, wherein the field of view of the display device is approximately -10 degrees to -30 degrees vertically.

43. The aircraft according to Claim 39 further comprising:  
a crewmember input device configured to transmit crewmember input data to the display processor to enable a crewmember to select options for controlling the subsystems and the display processor.

44. The aircraft according to Claim 31 further comprising:  
a third display device positioned between the first display device and the second display device, wherein the display processor is further configured to output an image of a moving map on the third display device, and to present an option to toggle display of the moving map image with another display image comprising a plurality of mutually exclusive windows of information, wherein the windows include information related to the aircraft and various aircraft subsystems.

45. The aircraft according to Claim 44, wherein:  
one window of the display image includes navigation information;  
another window of the display image includes aircraft attitude and speed information;  
another window of the display image includes engine information; and  
another window of the display image includes advisory information.

46. The aircraft according to Claim 31 further comprising:  
a terrain database coupled to the display processor to provide at least a portion of the  
desired out-the-window field of view on the display device.